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A MULTICUTTER SEMIAUTOMATIC

Engineer I. M. Levando

The Krasnyy proletariy Plant has manufactured a new Model 71 multicutter semiautomatic lathe; the chief designer of the lathe was Pribryukov. It is one of a series of semiautomatics for machining camshafts. The special features in its design are: standardization of its basic units to conform with those of the semiautomatic Models 72 and 73; a central drive for the work piece; the utilization of separate pneumatic cylinders for guiding, by means of a front floating center, the travel of the tailspindle, and the reverse (locking) of the upper half of the tailstock; and application of the principles of electro-automatics.

This machine is intended for turning journals and facing cams at the ends of the camshaft. It has a closed automatic cycle which is completed by an automatic lock. It has press-button control. The number of revolutions and amount of feed can be changed by substitution of change gears.

The basic units of the machine include bed, headstock, tailstock, central drive, and front and rear transverse supports. The number of supports depends on the shaft being machined; the maximum of each kind of support is two.

The headstock spindle is rotated by an individual electric motor through a wedge-shaped, five-belt transmission, change gears and spiral-bevel gears. The rotation of the spindle of the central drive is transmitted from the headstock spindle through cylindrical spiral gears, the drive shaft and the cylindrical herringbone gears. The number of spindle revolutions of the central drive is given in the following table:

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<u>No of Step</u>	<u>No of Teeth in Change Gears</u>		<u>No of Spindle Revolutions per Minute of Central Drive</u>
	A	B	
1	26	60	80
2	30	56	99
3	35	51	127
4	39	47	153
5	45	41	203

The chain of feed consists of an intermediate shaft with a gear, change gears, cylindrical gears, conical gears, by-pass clutch, worm gears, and a tumbler-cam. The worm gear is rigidly fastened to the tumbler cam, into the groove of which a roller is inserted. The shaft of the latter is connected with the slide. In rotating, the tumbler-cam moves the slide. The rack of the latter, coupled with a gear, rotates the bushing and gears which move the racks. The ends of the racks are joined by connecting rods to the support cams. Since the slide has a forward and reverse movement, depending on the direction of the spiral tumbler-cam, the racks are moved in the direction of the headstock during the forward travel and in reverse during return. The amount of feed is given in the following table:

<u>N of Step</u>	<u>No of Teeth in Change Gears</u>		<u>Feed per Spindle Revolution (mm)</u>		
	C	D	<u>Longitudinal (Longitudinal Supports)</u>	<u>Transverse (Front Supports)</u>	<u>Transverse (Rear Supports)</u>
1	26	62	0.15	0.06	0.06
2	31	57	0.20	0.07	0.08
3	36	52	0.25	0.09	0.11
4	41	47	0.32	0.11	0.14
5	47	41	0.42	0.15	0.18

An electric band brake is installed on the back wall of the headstock to act as a brake for the spindle when the machine is stopped. The tailstock spindle, moved by pneumatic cylinders, is fastened in the working position by an eccentric bushing.

The camshaft, when loaded on the semiautomatic machine, is brought to the middle gear from the side of the tailstock. For this purpose the upper half of the stock is reversed by a pneumatic cylinder situated inside the body. The reversing part of the stock is fastened in a working position by a conical lock, activated by the same pneumatic cylinder.

To the ends of the central drive spindle there are fastened two self-centering chucks with special jaws for each shaft being machined.

The cutters are cooled by an emulsion from a deep-plunging electric pump. The latter is switched on automatically when the machine is turned on.

Specifications

Swing over bed	250 mm
Swing over floor	1,000 mm
Distance from end of headstock to end of tailstock	1,085 mm
Maximum diameter of workpiece	82 mm
Maximum turning length with longitudinal support	100 mm
Maximum cross travel of front support	10 mm
Maximum cross travel of rear support	40 mm
Dimensions (length, width, and height)	3,010 x 1,980 x 1,410 mm
Weight	6.4 tons

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